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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,932	02/10/2004	Takafumi Morikawa	09792909-5805	3187
26263	7590	03/15/2006	EXAMINER	
SONNENSCHN NATH & ROSENTHAL LLP P.O. BOX 061080 WACKER DRIVE STATION, SEARS TOWER CHICAGO, IL 60606-1080			CHEN, KIN CHAN	
			ART UNIT	PAPER NUMBER
			1765	

DATE MAILED: 03/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/775,932

Applicant(s)

MORIKAWA ET AL

Examiner

Kin-Chan Chen

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— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3 and 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olsen (US 2004/0175961) or Kraus et al. (US 2004/0242021).

Olsen or Kraus teaches a method for semiconductor device fabrication. Olsen or Kraus teaches forming a nitrogen-containing oxide film on a substrate as a gate insulating film. The gate insulating film may be annealed in an oxygen-free, inert atmosphere. The gate insulating film may be annealed in an atmosphere containing oxygen. An electrode film may be formed in the gate insulating film which has been annealed twice. The annealing may be carried out in a pressure-reduced oxygen

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atmosphere. The annealing may be carried in various temperatures and pressure. See abstract, [0046] and [0047] of Olsen, or Fig. 3 and [0039] of Kraus.

As to claim 5, since the annealing in an atmosphere containing oxygen is performed at similar process conditions, it is expected that the method would contain the same properties and effects as claimed (such as suppressing the gate insulating film from being thickened and nitrogen from being segregated).

As to dependent claim 8, since the prior art teaches annealing in oxygen-free inert atmosphere, it is expected that the oxygen concentration is 10 ppb or less.

The claimed invention differs from Olsen or Kraus by teaches applying two annealing steps in reversed order. However, in the absence of showing criticality, it would have been obvious to one with ordinary skill in the art to apply two annealing steps in the foregoing order or in reversed order.

In general, the transposition of process steps or the splitting of one step into two, where the processes are substantially identical or equivalent in terms of function, manner and result, was held to be not patentably distinguish the processes. Ex parte Rubin 128 USPQ 440.

Changes in sequence of processing steps and the selection of any order of performing process steps are prima facie obvious in the absence of new or unexpected result. Ex parte Rubin, 128 USPQ 440. See also In re Burhans, 154 F.2d 690, 69 USPQ 330.

Furthermore, applicant's disclosure (the second paragraph of page 7) clearly states that the first and second annealing treatments may be carried out in this or reverse order.

4. Claims 1-3 and 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Visokay et al. (US 6,821,873).

Visokay teaches a method for semiconductor device fabrication. Visokay teaches forming a nitrogen-containing oxide film on a substrate as a gate insulating film. The gate insulating film may be annealed in an oxygen-free, inert atmosphere. The gate insulating film may be annealed in an atmosphere containing oxygen. An electrode film may be formed in the gate insulating film which has been annealed twice. The annealing may be carried out in a pressure-reduced oxygen atmosphere. The annealing may be carried in various temperatures, which read on dependent claims 3 and 7. See abstract, col. 2, line 37 through col. 3, line 25.

As to claim 5, Visokay teaches that the temperature, time, and pressure are chosen so as not to increase EOT (effective oxide thickness), col. 2, lines 64-66. Hence, it would have been obvious to one with ordinary skill in the art to perform routine experiments (by using different process parameters) to obtain optimal result with a reasonable expectation of success. Furthermore, the annealing in an atmosphere containing oxygen is performed at similar process conditions, it is expected that the method would contain the same properties and effects as claimed (such as suppressing the gate insulating film from being thickened and nitrogen from being segregated).

As to dependent claim 6, see col. 3, lines 1-3.

As to dependent claim 8, since the prior art teaches annealing in oxygen-free inert atmosphere, it is expected that the oxygen concentration is 10 ppb or less.

The claimed invention differs from Visokay by teaches applying two annealing steps in reversed order. However, in the absence of showing criticality, it would have been obvious to one with ordinary skilled in the art to apply two annealing steps in the

foregoing order or in reversed order because it is expected to have similar results in both ways.

In general, the transposition of process steps or the splitting of one step into two, where the processes are substantially identical or equivalent in terms of function, manner and result, was held to be not patentably distinguish the processes. Ex parte Rubin 128 USPQ 440.

Changes in sequence of processing steps and the selection of any order of performing process steps are prima facie obvious in the absence of new or unexpected result. Ex parte Rubin, 128 USPQ 440. See also In re Burhans, 154 F.2d 690, 69 USPQ 330.

Furthermore, applicant's disclosure (the second paragraph of page 7) clearly states that the first and second annealing treatments may be carried out in this or reverse order.

Response to Arguments

5. Applicant's arguments filed February 2, 2006 have been fully considered but they are not persuasive.

Applicant has argued that Olsen and Kraus are not prior art over the present application. It is not persuasive. As has been stated in the office action, applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55.

Applicant has argued that Visokay does not provide any suggestion that the steps may be performed in a different order. It is not persuasive. As has been stated in the office action, the claimed invention differs from Visokay by teaches applying two annealing steps in reversed order. However, in the absence of showing criticality, it would have been obvious to one with ordinary skilled in the art to apply two annealing

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steps in the foregoing order or in reversed order because it is expected to have similar results in both ways.

In general, the transposition of process steps or the splitting of one step into two, where the processes are substantially identical or equivalent in terms of function, manner and result, was held to be not patentably distinguish the processes. Ex parte Rubin 128 USPQ 440.

Changes in sequence of processing steps and the selection of any order of performing process steps are prima facie obvious in the absence of new or unexpected result. Ex parte Rubin, 128 USPQ 440. See also In re Burhans, 154 F.2d 690, 69 USPQ 330.

Furthermore, applicant's disclosure (the second paragraph of page 7) clearly states that the first and second annealing treatments may be carried out in this or reverse order.

Conclusion

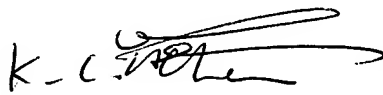
6. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (571) 272-1461. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

March 9, 2006


Kin-Chan Chen
Primary Examiner
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